MUNICIPAL WATER CONSERVATION PLAN

FOR

CITY OF SALINA, KANSAS

OCTOBER 1997
Revised JANUARY 2010

Original Plan in BLACK
All Proposed Revisions in RED

City to review and approve of revisions. Once finalized need to remove the strikethrough text and make all text black. Then submit to KWO and DWR for approval.

PREPARED BY
HDR
and
WILSON & COMPANY

10/2/97
09/09 Revised

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FOR CITY OF SALINA

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BACKGROUND INFORMATION

Under K.S.A. 82a-733, passed by the 1991 Kansas Legislature, "The Chief Engineer [of the Kansas Department of Agriculture Division of Water Resources] may require an applicant for a permit to appropriate water for beneficial use or the owner of a water right or permit to appropriate water for beneficial use to adopt and implement water conservation plans and practices." Other Kansas Statutes require water conservation plans for anyone: (1) purchasing water from the State Water Marketing Program (K.S.A. 82a-1311a); (2) participating in the Water Assurance District Program (K.S.A. 82a-1348); (3) sponsoring or purchasing the public water supply portion of a Multipurpose Small Lakes Program project (K.S.A. 82a-1608); (4) transferring water under the Water Transfers Act (K.S.A. 82a-1502); or (5) applying for a loan from the State Revolving Fund (K.S.A. 65-163g). All public water suppliers on the drought vulnerable list, which is a list maintained by the Kansas Department of Health and Environment and the Kansas Water Office, are encouraged to develop and implement a municipal water conservation plan and to resolve the limitations underlying their vulnerability. According to the 2006 Kansas Drought Vulnerable List, the City of Salina's public water supply is considered to be drought vulnerable because the primary raw water source is particularly sensitive to drought as evidenced by depleted streamflow, depleted reservoir inflow and storage, or by declining water levels in wells. The Kansas Water Office reviews and recommends all water conservation plans and the Division of Water Resources approves all water conservation plans.

The original Water Conservation Plan for the City of Salina was completed and adopted in October 1997 when the City applied for a loan from the State Revolving Fund for Water Treatment Plant improvements project. The original Water Conservation Plan was updated and revised in September 2009 in accordance with the 2007 Kansas Municipal Water Conservation Plan Guidelines published by the Kansas Water Office.

IMPORTANCE OF WATER CONSERVATION

Historically, water conservation measures have typically been invoked only during times of drought or other emergency water shortage. However, as Kansas water supplies continue to diminish, this view of water conservation is changing. Like many other public water suppliers, the City of Salina is looking to water conservation as a viable long-term supply option, helping to avert water and wastewater system expansions which results in significant savings in capital and operating costs. Ultimately, water conservation must be a shared responsibility between the City and all its water customers.

INTRODUCTION

The City of Salina obtains raw water from two sources: groundwater (wells) and surface water (Smoky Hill River).

The City of Salina has undertaken a number of steps to ensure a dependable water supply for our customers through the years. The original water treatment plant was constructed in the late 1950's with a major upgrade and expansion completed in 2001. ~~Construction of a water treatment plant was completed in the late 1950's. It~~ The treatment plant ~~currently~~ provides for partial water softening of the groundwater and surface water sources, as well as filtration and disinfection as required to meet current federal and state drinking water standards. ~~While several improvements have been made to the water treatment facility over the years, some key treatment processes and equipment have reached the extent of their useful life and need to be renovated. A water treatment plant improvement project will begin construction in 1998 and is scheduled for completion in 2000.~~ The current conjunctive use of surface water and groundwater as sources of water supply allows the City some redundancy for their source of supply. However, the wells that provide the City their groundwater supply are connected to the river flows in the Smoky Hill River and when the City experiences a significant drought period, both supply sources are strained.

The Salina water supply, water treatment plant, and distribution system ~~now~~ have ample capacity to meet current customers' demands under normal conditions. The ~~scheduled~~ 2001 plant improvements ~~will~~ increased the production capacity to 20 million gallons per day (MGD) and should meet future projected demands for several years~~, except during drought periods~~. However, with continuing business and commercial and population growth expected, a concerted effort on water conservation planning can help ensure customers of a dependable water supply in future years.

The City of Salina believes that the Municipal Water Conservation Plan represents an additional major step in ensuring our customers of a dependable water supply in future years. ~~This water conservation plan was developed to meet the guidelines of the Kansas Water Office.~~ The plan includes a water use conservation goal, a long-term water use efficiency plan, a drought/emergency ~~contingency~~ response plan, and provisions for monitoring, evaluating, and revising the plan.

MUNICIPAL WATER CONSERVATION PLAN

The primary objectives of the Water Conservation Plan for the City of Salina are to develop long-term water conservation plans (Long-Term Water Use Efficiency Section) and short-term water emergency plans (Drought/Emergency ~~Contingency~~ Response Section) to assure the City customers of an adequate water supply to meet their needs. The efficient use of water also has the beneficial effect of limiting or postponing additional water ~~distribution~~ system expansion and thus limiting or postponing the resultant increases in costs, in addition to conserving the limited water resources of the State of Kansas.

LONG-TERM WATER USE EFFICIENCY

WATER USE CONSERVATION GOALS

The City of Salina used ~~119~~ 116 gallons per ~~person~~ capita per day (gpcd) in ~~1995~~ 2007. Over a five year period ~~(1991-1995)~~ (2003-2007) Salina used an average of ~~125~~ 124 gpcd. The gpcd figure includes:

a) water sold to residential and commercial customers;
b) water distributed for free public services (fire protection, street cleaning, etc.); and
c) water lost by leaks in the water distribution system.

However, the gpcd figure does not include municipally supplied industrial water for industries that use over 200,000 gallons per year. According to ~~Figure 1~~ Table 9, shown in the ~~1995 Kansas Municipalities Water Use Publication~~ Kansas Municipal Water Use 2007 Publication, Salina is a large public water supplier located in Region 7. From this publication it was determined that Salina's ~~1995~~ 2007 water use was 14 percent below the Region 7 large supplier average of ~~139~~ 135 gpcd. Over a five year period ~~(1991-1995)~~ (2003-2007), Salina's water use was 124 gpcd which is 12 percent below the Region 7 large supplier region average of ~~141~~ 142 gpcd. The City desires to set a water conservation goal not to exceed ~~140~~ 116 gpcd, which is believed to be sustainable based on water usage during the drought of 2000 through 2006 and implementation of conservation practices outlined in this plan. The City anticipates not exceeding this goal by carrying out the specific water conservation practices that are outlined in our plan.

WATER CONSERVATION PRACTICES

The City's conservation practices include actions that will reduce overall demand for water, diminish water usage at peak demand time, improve efficiency in water use, and reduce water losses and waste. This section of the plan summarizes the current and proposed education, management, and regulation efforts that relate to the long-term conservation of

water in the City of Salina. Specific practices that will be undertaken to conserve water are listed and a target date to begin each practice is also shown.

Education

The following is a list of current and proposed water use efficiency education practices:

1. The City makes available information on water conserving landscape practices through publications, local news media, seminars or other appropriate means.

2. Water bills show the amount of water used in cubic feet during the billing period and the number of cubic feet used last year during the same billing period.

3. Water conservation tips are provided with the monthly water bills during the summer months.

4. Information is provided to the general public on lawn water requirements on a regular basis during the summer months.

5. Water bills will show the amount of water used in gallons and the cost of water.
   Target Date: 1 January 2011

6. Water bills will show the amount of water used in gallons during this billing period and the number of gallons used last year during the same billing period.
   Target Date: 1 January 2011

7. Water conservation classes will be offered by the City to teach customers about water conservation.
   Target Date: 1 January 2011

8. The Board of Education and teachers will be encouraged to become involved in water conservation through classroom lectures and incentives for children to conduct home checks.
   Target Date: 1 January 2011

Management

The following is a list of current and proposed water use efficiency management practices:

1. All raw water intakes have meters installed and the meters are repaired or replaced promptly. Raw water meters are tested for accuracy at least once every three years. Each meter is repaired or replaced if its test measurements are not within two percent of the actual volume of water passing through the meter.

2. All raw water meters and individual service connections are read at least on a monthly basis.

3. The City currently conducts a water management review, which results in a specified change in water management practices or implementation of a leak detection and repair program or plan, whenever the amount of unsold water exceeds 20 percent of the total raw water ~~intake~~ diverted for a four month time period.

4. Water sales are based on the amount of water used.

5. Meters are installed at all residential service connections and at all other service connections, including separate meters for municipally owned irrigation systems.

6. Meters at each individual service connection (one inch or less) are replaced on a regular basis, at least once every ~~10~~ 15 to 20 years.

7. The current water rate structure, adopted in June 2008, is an excess use rate where the unit price for water increases after a specified volume consumed is exceeded. The City's excess use rate structure is based around average winter consumption in order to promote water conservation.

8. The City's water distribution system is divided into five pressure zones. The pressure zones have been established to provide adequate water pressure to customers. Water pressure is monitored daily at each of the City's pumping facilities. Water pressure at the customers' premises is checked at the customer's request.

9. Individual service connection meters between one inch and six inches will be tested for accuracy at least once every five years and meters six inches and above will be tested on at least an annual basis. Each meter will be repaired or replaced if its test measurements are not within two percent of the actual volume of water passing through the meter.
   Target Date: 1 January 2011

10. Develop and implement a water conservation rebate program for high efficiency/low flow toilets for residences and commercial businesses and high efficiency clothes washers for residences.
   Target Date: 1 January 2011

11. Develop and implement a rain sensor rebate program for rain sensors that automatically shut off automatic sprinkler systems during and after rain events and allow the system to go back to normal cycle when the sensors dry out.
   Target Date: 1 January 2011

Regulation

The following is a list of current and proposed water use efficiency regulation practices:

1. All new or renovated construction requires toilets that use ~~3.5~~ 1.6 gallons per flush or less and low flow shower heads that use 2.5 gallons per minute or less.

2. An ordinance was adopted in June 2008 which prohibits waste of water.

3. An ordinance was adopted in June 2008 which prohibits outdoor watering between the hours of 10:00am and 6:00pm effective between June 1 and September 30.

4. An ordinance was adopted in June 2008 which allows the governing body of the City to adopt or amend a water conservation rebate program.

5. The ordinance for restricting outdoor watering between the hours of 10:00am and 6:00pm effective between June 1 and September 30 will be revised to include all private domestic wells within the City limits, not just the customers of the water distribution system.
   Target Date: 1 June 2010

6. Develop and implement a program or ordinance to incorporate water conserving landscape principles into future landscape development projects, including renovation of existing landscapes.
   Target Date: 1 January 2011

DROUGHT/EMERGENCY ~~CONTINGENCY~~ RESPONSE

The Drought/Emergency Response applies to all persons, customers, and property served by the City of Salina. All entities that purchase water from the City of Salina will be required to follow the same reductions in water use as the City of Salina.

The Drought/Emergency Response also applies to private domestic well owners within the city limits. Under K.S.A. 82a-733(a) the Chief Engineer of the Kansas Department of Agriculture Division of Water Resources (whom approves water conservation plans) has the authority to require the owner of a water right or a permit to appropriate water for beneficial use to adopt and implement conservation plans and practices. Under K.S.A. 82a-733(i) the Chief Engineer of the Kansas Department of Agriculture Division of Water Resources can require private domestic well owners to implement water conservation practices so they are compliant with the cities' water conservation plan. Conditions under which private domestic well owners may be required to implement water conservation measures include (1) when impairment to senior water rights is occurring, (2) when a municipality with a common source of supply is experiencing a period of drought, and water watches, warnings or emergencies are in place, and (3) when the waste of water is occurring.

The City of Salina shall regulate the private domestic wells based on conditions two and three above. According to a publication by the Kansas State University Extension Service (*Watering Your Lawn* by Matthew J. Fagerness), the morning is the most efficient time to water lawns and gardens because it is cooler and less evaporation occurs. Wind is also less likely to be a problem during the early morning hours. Watering during the afternoon hours

when high evaporation, low humidity, and high winds occur is considered waste of water because during these times the water applied has a higher percentage of loss than that actually put to beneficial use. On the basis of waste of water and per state statutes and the 2007 Municipal Water Conservation Plan Guidelines the City will prohibit outdoor watering during the hours of 10:00 AM to 6:00 PM between June 1 through September 30 of each year for all customers of the water distribution system and all private domestic wells within the city limits.

The City of Salina addresses its short-term water shortage problems through a series of stages based on conditions of supply and demand with accompanying triggers, goals, and actions. Each stage is more stringent in water use than the previous stage since water supply conditions are more deteriorated. The water shortage may be the result of a drought or a system failure. A drought may deplete the available water supplies or place stress on the City's ability to deliver water. A system failure could occur that would threaten the City's ability to deliver water to the entire service area.

The declaration of the beginning and end of a water watch, water warning, or water emergency shall be effective upon their publication in the official city newspaper. The City Manager is authorized by ordinance to implement the appropriate conservation measures. A copy of the Water Conservation Ordinance is included in Appendix A.

STAGE 1: WATER WATCH

Triggers

This stage is triggered by any one of the following conditions:

1. Treatment plant operations are at 75 percent capacity or more for three consecutive days, or
2. ~~Groundwater levels have fallen 5 feet below the normal seasonal level~~ When groundwater is the only source and groundwater levels at Oakdale Monitoring Well have fallen below a saturated aquifer thickness of 29 feet, or
3. Smoky Hill River levels are below ~~45~~ 40 cfs at the Mentor Gage during the months of June through September and the river flow has been in a declining trend for at least seven consecutive days, or
4. Smoky Hill River levels are below 30 cfs at the Mentor Gage during the months of October through May and the river flow has been in a declining trend for at least seven consecutive days, or
5. Emergency conditions related to repairs or water quality.

Goals

The goals of this stage are to heighten awareness of the public on water conditions, ~~and~~ to maintain the integrity of the water supply system, and to ask for voluntary reductions in water use to avoid having to implement mandatory restrictions.

Education Actions

1. The City will make occasional news releases to the local media describing present conditions and indicating the water supply outlook for the upcoming season.
2. Previous months summaries of precipitation, temperature, and water levels will be made public at the beginning of each month.

Management Actions

1. Leaks will be repaired within 8 hours of detection.
2. The City will monitor its use of water and will curtail activities such as hydrant flushing and street cleaning, including watering of City grounds and washing of vehicles.

Regulation Actions

1. The public will be asked to curtail some outdoor water use and to make efficient use of indoor water, i.e. wash full loads, take short showers, don't let faucets run, etc.
2. Any other action deemed appropriate by the City Manager.

Requirements for Termination of WATER WATCH

The WATER WATCH will be terminated following consideration of the following information:

- Have Treatment Plant operations been below 75 percent operating capacity for three consecutive days?
- When groundwater is the only source, have groundwater levels at the Oakdale Monitoring Well risen above a saturated aquifer thickness of 29 feet?
- Are the Smoky Hill River levels above 40 cfs at the Mentor Gage during the months of June through September and the river flow has not declined for seven consecutive days?
- Are the Smoky Hill River levels above 30 cfs at the Mentor Gage during the months of October through May and the river flow has not declined for seven consecutive days?
- Are there any emergency conditions related to repairs or water quality?
- What is the current and projected length of the drought?
- What is the short and long range precipitation forecast?
- What are the current and future releases from the Kanopolis Reservoir?

The City will continue to promote wise outdoor watering throughout the summer months.

STAGE 2: WATER WARNING

Triggers

This stage is triggered by any one of the following conditions:

1. Treatment plant operations are at 90 percent capacity or more for three consecutive days, or
2. ~~Groundwater levels have fallen 10 feet below the normal seasonal level~~ When groundwater is the only source and groundwater levels at Oakdale Monitoring Well have fallen below a saturated aquifer thickness of 27 feet, or
3. Smoky Hill River levels are below 30 cfs at the Mentor Gage during the months of June through September and the river flow has been in a declining mode for at least five consecutive days, or
4. Smoky Hill River levels are below 20 cfs at the Mentor Gage during the months of October through May and the river flow has been in a declining mode for at least five consecutive days, or
5. Emergency conditions related to repairs or water quality.

Goals

The goals of this stage are to reduce peak demands by 20%, ~~and~~ to reduce overall weekly consumption by 10%, and to decrease the impact on the sources of supply.

Education Actions

1. The City will make weekly news releases to the local media describing present conditions and indicating the water supply outlook for the upcoming week.
2. Previous week summaries of precipitation, temperature, and water levels will be made public each Thursday.
3. Water conservation articles will be provided to the local newspaper.

Management Actions

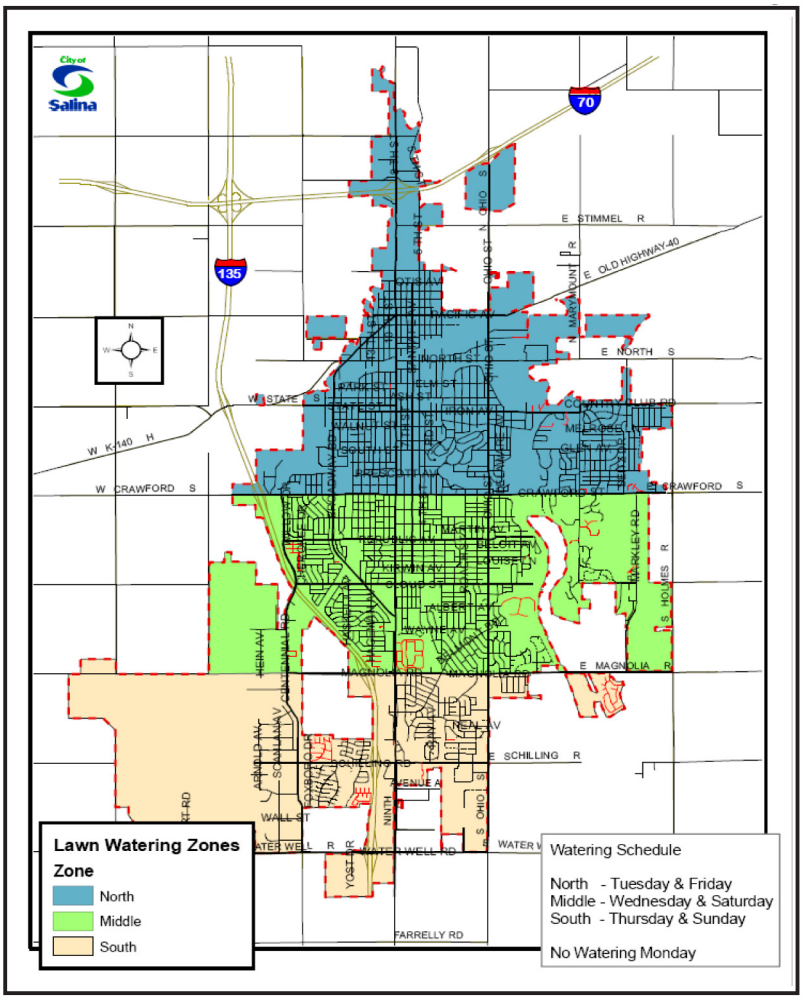
1. The City's water supplies will be monitored daily.
2. Leaks will be repaired within 8 hours of detection.
3. ~~Standby (Schilling) wells~~ Emergency water supplies will be prepared for contingency operation.
4. The City will curtail its water usage, including watering of City grounds and washing of vehicles.

Regulation Actions

1. The City at their option, based on current staffing and system operational considerations, will implement one of the lawn watering systems below:

   - An odd/even lawn watering system ~~will~~ may be imposed on City residents. Residents with odd-numbered addresses will water on odd days, and even addresses will water on even days.
   - A zoned lawn watering system will be imposed on all water customers. Customers will be allowed to water twice per week based upon three geographical zones as follows:

     North Zone: North Salina to Crawford – Tuesday and Friday
     Middle Zone: Crawford to Magnolia – Wednesday and Saturday
     South Zone: Magnolia to South Salina – Thursday and Sunday
     (No lawn watering is allowed on Monday)



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2. Commercial/Industrial owners will be allowed to preserve vegetation required by the City's landscaping ordinance.
~~2. Outdoor water use, including lawn watering and car washing will be restricted to before 10:00am and after 9:00pm.~~
3. Refilling of swimming pools will be allowed one day a week after sunset.
~~4. Excess water use charges for usage of water over the amount used in the winter~~
4. Waste of water will be prohibited
5. Home outdoor washing of vehicles will be restricted to once per week on Saturdays only.
6. Restrictions will be imposed on all City residents (including private domestic well users, if authority is delegated by the Chief Engineer under K.S.A. 82a-733(i)).
7. Any other action deemed appropriate by the City Manager.

Requirements for Termination of WATER WARNING

The WATER WARNING will be terminated following consideration of the following information:

- Have Treatment Plant operations been below 90 percent operating capacity for three consecutive days?
- When groundwater is the only source, have groundwater levels at the Oakdale Monitoring Well risen above a saturated aquifer thickness of 27 feet?
- Are the Smoky Hill River levels above 30 cfs at the Mentor Gage during the months of June through September and the river flow has not declined for five consecutive days?
- Are the Smoky Hill River levels above 20 cfs at the Mentor Gage during the months of October through May and the river flow has not declined for five consecutive days?
- Are there any emergency conditions related to repairs or water quality?
- What is the current and projected length of the drought?
- What is the short and long range precipitation forecast?
- What are the current and future releases from the Kanopolis Reservoir?

Upon termination of a WATER WARNING, a WATER WATCH becomes operative.

STAGE 3: WATER EMERGENCY

Triggers

This stage is triggered by any one of the following conditions:

1. Treatment plant operations are at 100 percent capacity or more for three consecutive days, or

2. ~~Groundwater levels have fallen 15 feet below the normal seasonal level~~ When groundwater is the only source and groundwater levels at Oakdale Monitoring Well have fallen below a saturated aquifer thickness of 25 feet, or
3. Smoky Hill River levels are below ~~15~~ 20 cfs at the Mentor Gage during the months of June through September and the river flow has been in a declining mode for at least three consecutive days, or
4. Smoky Hill River levels are below 15 cfs at the Mentor Gage during the months of October through May and the river flow has been in a declining mode for at least three consecutive days, or
5. Emergency conditions related to repairs or water quality.

Goals

The goals of this stage are to reduce peak demands by 50%, ~~and~~ to reduce overall weekly consumption by 25%, and to decrease the impact on the sources of supply.

Education Actions

1. The City will make daily news releases to the local media describing present conditions and indicating the water supply outlook for the next day.
2. Previous days summaries of precipitation, temperature, and water levels will be made public each day.
3. The City will hold public meetings to discuss the emergency, the status of the City's water supply and further actions which need to be taken.

Management Actions

1. The City's water supplies will be monitored daily.
2. Leaks will be repaired within 8 hours of detection.
3. ~~Standby (Schilling) wells~~ Emergency water supplies will be prepared for contingency operation.
4. The City will seek additional emergency water supplies from state or federal agencies.

Regulation Actions

1. Outdoor water use will be banned.
2. Waste of water will be prohibited.
3. Restrictions will be imposed on all City residents (including private domestic well users, if authority is delegated by the Chief Engineer under K.S.A. 82a-733(i)).
4. Any other action deemed appropriate by the City Manager.

Requirements for Termination of WATER EMERGENCY

The WATER EMERGENCY will be terminated following consideration of the following information:

- Have Treatment Plant operations been below 100 percent operating capacity for three consecutive days?
- When groundwater is the only source, have groundwater levels at the Oakdale Monitoring Well risen above a saturated aquifer thickness of 25 feet?
- Are the Smoky Hill River levels above 20 cfs at the Mentor Gage during the months of June through September and the river flow has not declined for three consecutive days?
- Are the Smoky Hill River levels above 15 cfs at the Mentor Gage during the months of October through May and the river flow has not declined for three consecutive days?
- Are there any emergency conditions related to repairs or water quality?
- What is the current and projected length of the drought?
- What is the short and long range precipitation forecast?
- What are the current and future releases from the Kanopolis Reservoir?

Upon termination of a WATER EMERGENCY, a WATER WARNING becomes operative.

PLAN REVISION, MONITORING, AND EVALUATION

The City of Salina reviews monthly totals for water production, residential sales, commercial sales, water used for line flushing and fire protection, and water lost through system leaks. Problems noted during the monthly review will be solved as soon as possible.

The City of Salina Municipal Water Conservation Plan will be reviewed during the month of April each year and on a more frequent basis during drought or other water shortage conditions. If the water conservation gpcd goals for the previous year are not met, then the City will review the data collected from the previous year in relationship to the status and effectiveness of the conservation practices that are outlined in our plan and will provide a status report to the Division of Water Resources (or whatever state agency is responsible for approving and monitoring our plan), which will also include any additional water conservation practices that may need to be taken in order for the City to achieve and maintain its water use conservation gpcd goals.

APPENDIX A

Water Conservation Ordinance